teachers guide

Soil life 1
Life in the soil

Components

	NAME	DESCRIPTION	AUDIENCE
	Life in the soil teachers guide	This guide includes discussion points to engage students' interest in the world beneath their feet.	teachers
	Ecosystems presentation	This presentation contains images of contrasting environments, including soil, that display a variety of organisms.	students

Purpose

To **Engage** students' interest and enable them to build an understanding of the variety and importance of soil fauna.

Outcomes

Students:

- appreciate that there is an exciting and diverse ecosystem, full of unusual organisms, right beneath their feet; and
- offer their own explanations as to why soil is important.

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Teacher shows the presentation, *Ecosystems*.	teacher-led presentation
discussion	teacher-led, whole group

Information for teachers

The presentation, *Ecosystems*, contains images of familiar Australian ecosystems (rainforest, desert and wetland) and a more unfamiliar ecosystem, soil.

Teachers display the presentation. For each ecosystem, challenge students to suggest what organisms might live there, before revealing examples. The soil ecosystem is introduced with examples of familiar macrofauna, before including smaller (and less familiar) mesofauna and microorganisms.

Organisms appear in the following order:

SECTION	CONTENTS
rainforest (Daintree)	spider, Boyd's forest dragon, tree frog, tawny frogmouth, tree snake
desert (Alice Springs)	kangaroo, dingo, spinifex hopping mouse, bilby, thorny devil
wetland (Herdsman Lake, Perth)	Pacific black duck, western tiger snake, dragonfly, motorbike frog
soil macrofauna	earthworm, ant, slater, spider, pie dish beetle, centipede
soil mesofauna	springtails, mites, pseudoscorpions, nematodes
soil microbes	bacteria, fungi

Technical requirements

The guide requires Adobe Reader (version 5 or later), which is a free download from www.adobe.com. The presentation is provided in two formats: Microsoft PowerPoint and Adobe PDF.

Suitable discussion questions and suggested responses:

QUESTION	SUGGESTED RESPONSE
What is an ecosystem? Describe some other examples of ecosystems.	An ecosystem is a system formed by interaction between living things and their non-living surroundings.
Is soil an ecosystem?	Soil is an ecosystem as it contains abundant life, has physical features, and interaction between them creates a viable system.
In what ways do soils benefit humans?	Soil provides nutrients to plants, that may become food we eat, or provide food for animals we eat. Components of soil are used in medicine, eg Actinomycetes, a soil bacteria that has been used to produce several antibiotics. Components of soil are used in art, eg pottery and pigments. Components of soil are useful in food production, eg camembert and brie cheese are both encased in a cover of Penicillium mould (the white outer layer) that helps it ripen. Note: Students may come up with responses such as mineral cosmetics, bricks and cement. Whilst these do originate in the earth, they are made from rocks and minerals rather than soil. Soil does contain small quantities of rocks and minerals, however large-scale production requires the use of components beneath soil, rather than soil itself.
How is the soil ecosystem important?	Soil is present in all terrestrial ecosystems and plays an important role as: • a fertile substrate in which plants grow; • a source and store of water; • a source of elements essential for life (eg carbon and nitrogen); • a source and store of heat; • part of matter cycling systems, including a role in waste degradation and water purification; • a habitat for organisms; • a store of gases such as carbon dioxide, oxygen and nitrogen; and • a record of historical events (eg fossils and climate).

Image credits

presentation, *Life in the soil*

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Associated SPICE resources

Soil life 1: Life in the soil may be used in conjunction with related SPICE resources.

DESCRIPTION	LEARNING PURPOSE
Soil life (overview) This learning pathway shows how a number of SPICE resources can be combined to assist with teaching the topic of ecology.	
Soil life 1: Life in the soil This resource engages student interest in the variety and importance of soil fauna.	**Engage**
Soil life 2: Exploring soil Videos guide students through the process of sampling soil and extracting soil fauna, which they then identify.	**Explore**
Soil life 3: Soil ecosystem Students use worksheets and an interactive learning object to construct food chains and food webs. An animated video explains the concept of energy flow through ecosystems.	**Explain**
Soil life 4: Soil investigation Students investigate the importance of the sampling strategy by using an interactive learning object to see how observed sampling results vary with each organism.	**Explore/Explain**
Soil life 5: Soil scientists Interviews with soil scientists illustrate the importance of different sampling strategies in their research.	**Elaborate**

Acknowledgements

Science advisers: Honorary Associate Professor Adrianne Kinnear (School of Natural Sciences, Edith Cowan University) and Winthrop Professor Lynette Abbot (Faculty of Natural and Agricultural Sciences, The University of Western Australia).

Designed and developed by the Centre for Learning Technology, The University of Western Australia. Production team: Anton Ball, Leanne Bartoll, Helen Billiald, Kim Braimbridge, Jan Dook, Alwyn Evans, Bob Fitzpatrick, Dan Hutton, Bec McKinney, Paul Ricketts, Jodie Ween and Michael Wheatley. Thanks to Jenny Gull, Pauline Charman, Charmaine White and Wendy Sanderson.

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